GENERATING MEDIA OUTPUT DURING BIOS BOOT-UP

The present application is a continuation-in-part application of pending U.S. application Ser. No. 09/336,509, filed Jun. 18, 1999.

BACKGROUND

1. Field of the Invention

This invention relates to multimedia. In particular, the invention relates to graphic display and sound generation from firmware. The invention further relates to display of graphical display of system and/or system device information (e.g., device parameters).

2. Description of Related Art

Generating a media output such as an image of a graphic object can be performed in a number of ways. If the graphic object is represented by bit-mapped graphic data, a graphic engine can read the bit-mapped pixels directly and renders the appropriate colors according to the pixel values. If the graphic object is formed by a series of vector operations, the graphic controller can perform vector-generating operations sequentially.

Although the above methods can be used in a traditional graphics environment, they may not be suitable in applications where highly organized data structures are required. One example of such applications is the display of graphics during the basic input and output system (BIOS) boot-up. In such applications, it is preferable that the image of the graphic object to be generated as fast as possible. Furthermore, the image content may change frequently as the system updates its database.

Traditional methods usually generate the image directly from the graphic object. These methods suffer a number of drawbacks. First, it is difficult to update the graphic objects, especially when only a portion of the image set needs to be updated. Second, they require more storage to organize the graphic object. Third, they do not provide a flexible way to render the image such as mixing different image characteristics (e.g., color, layout).

Therefore there is a need in the technology to provide a simple and efficient method to generate a media output.

Currently, if additional functionalities are being added to the system BIOS, significant changes have to be implemented. In particular, the system BIOS code has to be significantly revised. Accordingly, there is a need to provide additional functionalities to system BIOS without having to significantly alter the system BIOS code. There is also a further need in the industry to provide and display system device information simply and efficiently.

In addition, device parameter such as processor performance information and memory size information, are traditionally display in textual format. Such system device information is typically determined at the time of manufacture. During the boot process, the system device information (e.g., device parameters) determined at the time of manufacture is detected and/or retrieved by the system BIOS and displayed in textual format. Such information is difficult to view as the user has to sort through lines o text to locate the desired information. There is thus a further need in the industry to provide and display system device information, such as device parameters, simply and efficiently.

SUMMARY

The present invention is a method and apparatus to display information. The method comprises retrieving a first value representative of a first device parameter, and detecting a second value representative of a second device parameter. A template corresponding to a graphic object is retrieved from a storage. A graphic attribute that characterizes the graphic object is generated from the template. The first and second values displayed and an image is generated from the graphic object according to the graphic attribute.

BRIEF DESCRIPTION OF THE DRAWINGS

The features and advantages of the present invention will become apparent from the following detailed description of the present invention in which:

FIG. **1** is a system block diagram of one embodiment of an information distribution system in which the apparatus and method of the invention is used.

FIG. **2** illustrates an exemplary processor system or user computer system, which implements embodiments of the present invention.

FIG. **3** illustrates a logical diagram of one embodiment of the invention.

FIG. **4**A and FIG. **4**B illustrates one embodiment of a process flow chart provided in accordance with the principles of the invention.

FIG. **5** is a diagram illustrating an architecture to generate an image for display according to one embodiment of the invention.

FIG. **6**A is a diagram illustrating a template for the graphic object according to one embodiment of the invention.

FIG. **6**B is a diagram illustrating a display screen according to one embodiment of the invention.

FIG. **7** is a flowchart illustrating a process to display an image according to one embodiment of the invention.

FIG. **8** illustrates one embodiment of the information display screen in accordance with the principles of the invention.

FIG. **9** is a flowchart illustrating one embodiment of a process to display information in accordance with the principles of the invention.

FIG. **10**A illustrates one embodiment of the information display screen in accordance with another aspect of the invention.

FIG. **10**B illustrates a second embodiment of the information display screen in accordance with another aspect of the invention.

FIG. **11**A is a diagram illustrating one embodiment of a system architecture of the software modules implemented in accordance with the principles of the invention.

FIG. **11**B is a chart illustrating one embodiment of a processor mapping table.

FIG. **12** is a flowchart illustrating one embodiment of a process to display information in accordance with the principles of the invention.

FIG. **13** is a flowchart illustrating one embodiment of a function dispatcher process provided in accordance with the principles of the invention.

FIG. **14** is a flowchart illustrating one embodiment of an information handler process provided in accordance with the principles of the invention.

FIG. **15** is a flowchart illustrating one embodiment of a processor information and image handler process provided in accordance with the principles of the invention.

Description

The present invention is a method and apparatus to generate a media output during BIOS boot-up. In one